

Phelister Marseul, 1854 in Cuba: first West Indies records of *Phelister completus* Schmidt, 1893, and notes on other Cuban species (Coleoptera, Histeridae, Histerinae)

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Abstract

We present a key to the three species of the genus *Phelister* Marseul, 1854 (Coleoptera, Histeridae), occurring in Cuba along with diagnoses and habitus drawings. All three species are newly recorded for the cadaveric fauna in Cuba. In addition, we address the taxonomic composition and distribution of the genus *Phelister* in the country. *Phelister completus* Schmidt, 1893 from the West Indies is recorded for the first time from Cuba.

Keywords

Exosternini, faunistics, new records, taxonomy

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Introduction

The clown beetles in the genus *Phelister* Marseul, 1854 are small Histerinae (Histeridae) roughly characterized by the presence of a projecting mesoventral margin and a simple annulated antennal club (Kovarík and Caterino 2001). The group is clearly non-monophyletic and lacks diagnostic apomorphies (Caterino and Tishechkin 2015). To date, *Phelister* comprises 95 species in the New World (Caterino and Tishechkin 2019), with the majority of the diversity in South America.

Hitherto, the genus *Phelister* has been represented in Cuba only by *Phelister haemorrhous* Marseul, 1854 and *Phelister panamensis* LeConte, 1859 (Sokolov 2005; Caterino and Tishechkin 2019). However, the actual

number is probably somewhat higher, since the Cuban as well as Caribbean *Phelister* are largely understudied.

Many histerid beetles occur on carrion during both fresh and advanced stages of decomposition (Kovarík and Caterino 2016; Correa et al. 2020). However, little is known about the associations of *Phelister* species in Cuba. A paucity of information on this diverse group of beetles prompted this study. We, therefore, present here a summary of previously published and new information on members of the genus *Phelister* in Cuba, including general information on potential forensic importance, zoogeography, and bionomics. We also provide a key to distinguish the Cuban species of *Phelister*.

Methods

Specimens examined. Descriptions, data on geographical distribution and other findings reported in this paper are based on examination of recently collected or historical adult specimens deposited in the following collections:

CZCTR Museo de Historia Natural “Charles Ramsden”, Facultad de Ciencias Naturales, Universidad de Oriente, Santiago de Cuba, Cuba (M. Soto)

ZSM Zoologische Staatssammlung, Munich, Germany (M. Balke)

IZAC Collections of the Institute of Ecology and Systematics (IES) of the Academia de Ciencias de Cuba; containing the historically important collection of the Instituto de Zoología de la Academia de Ciencias de Cuba (I. Fernández)

CMNC Canadian Museum of Nature Collection, Ottawa, Canada (R.S. Anderson)

FMNH Field Museum, Chicago, USA (Maureen Turcatel)

Morphological observations. Diagnoses were made using an MBS-9 or Wild MZ8 stereomicroscope. Body measurements were taken to the nearest 0.1 mm, with an ocular micrometer. Measurement followed Megna and Epler (2012). Body length was measured from anterior angle of pronotum to elytral apex, without including head and propygidium and pygidium. Body width was measured at maximum width of elytra, at the humeri. The terminology of the main striae and parts of the body follows Caterino and Tishechkin (2015). Nomenclature is based on the classification proposed by Mazur (2011). The following abbreviations are used in the text: TL (total length, without head, propygidium and pygidium, measured across midline), and MW (maximum width, across greatest transverse width of both elytra combined).

Taxonomy. For the identification of *Phelister* species of Cuba it is often necessary to use a combination of three taxonomic characters: (1) the cuticular color, (2) the pattern of dorsal striation and punctation, and (3) the shape of the propygidium and pygidium. Specimens were identified using the keys of Wenzel and Dybas (1941) and Caterino and Tishechkin (2019), as well as by comparing them with reliably identified voucher specimens deposited in the collection of M.S. Caterino.

Distribution. Maps indicating the known distribution of the genus *Phelister* in Cuba are given for each species. They are based on specimens examined as well as literature records. The principal faunal studies that we have consulted are those of Blackwelder (1944), Sokolov (2005), Mazur (2011), and Caterino and Tishechkin (2019).

Stages of decomposition. The extent of the body's decomposition determines which insects are present. These changes make it hospitable for different insects at different times. The classification of stages of decomposition was based on the proposal by Hart et al. (2008), with five:

fresh, bloated, decay, post-decay, skeletal. The specimens were collected on human, pig (*Sus domestica*), cow (*Bos taurus*), and horse (*Equus caballus*) carcasses.

Results

Phelister completus Schmidt, 1893

Figures 1a, 2a, Table 1

Phelister completus Schmidt 1893: 81—Wenzel and Dybas 1941: 456; Blackwelder 1944: 184; Mazur 2011: 27.

New records. CUBA • 1 specimen; Santiago de Cuba Province, Cuabitas; 20.053°, −075.805°; 100 m a.s.l.; 14 Mar. 2010; Y. Lamothe leg.; CUB_YL_2010_01; CZCTR; found in pig. • 1 specimen; Santiago de Cuba Province, Jardín Botánico [= Botanical garden]; 20.006°, −075.797°; 50 m a.s.l.; 5–17 Dec. 1995; S. Peck_95–72; CMNC. • 1 specimen; Santiago de Cuba Province, Jardín Botánico [= Botanical garden]; 20.039°, −075.8799°; 50 m a.s.l.; 4–17 Dec. 1995; L. Masner_C-21_95–109; CMNC; yellow pan traps. • 1 specimen; Santiago de Cuba Province, 6 km NE Siboney, Río Juragua; 19.916°, −075.617°; 150 m a.s.l.; 7 Jul. 1995; S. Peck_95–86; CMNC; trees base litter.

Identification. TL = 2.02 mm; MW = 2.03 mm; body color piceous; frontal stria uninterrupted; supraorbital stria continuous with frontal stria; pronotum with depression on each side near anterior angle and without pre-scutellar impression; elytron with complete marginal epipleural and marginal elytral striae, outer subhumeral stria complete, extending to apex, inner subhumeral stria absent, dorsal striae I–V and sutural one complete, strongly impressed, dorsal elytral stria V united under a rather narrow arch with the sutural one (Fig. 1a); propygidium relatively long, subequal to or greater in midline length than pygidium; prosternal keel with carinal striae complete from base to presternal suture, ending freely anteriorly; protrochanter lacking setae; protibia with six evenly spaced marginal spines and with one longitudinal stria on ventral surface.

Distribution. Previously, *P. completus* had been recorded solely from Mexico and Costa Rica (Mazur 2011). Its range of distribution is now extended to the West Indies (Fig. 2a). This is the first record of this species from Cuba. The species has also been found in Panama and southern Florida, USA (Caterino unpubl. data).

Phelister haemorrhous Marseul, 1854

Figures 1b, 2b, Table 1

Phelister haemorrhous Marseul 1854: 476—Blackwelder 1944: 185; Summerlin et al. 1991a: 312; Sokolov 2005: 85; Mazur 2011: 27; Dégallier et al. 2012: 38, 2017: 83; Caterino and Tishechkin 2019: 49.

Phelister egenus Marseul 1854: 480—Mazur 1984: 283.

Phelister rubicundus Marseul 1889: cxlvi—Caterino and Tishechkin 2019: 49.

New records. CUBA • 2 specimens; Santiago de Cuba Province, Quintero, Finca de la Universidad de Oriente; 20.048°, −075.819°; 38 m a.s.l.; 14 Mar. 2010; Y. Lamothe

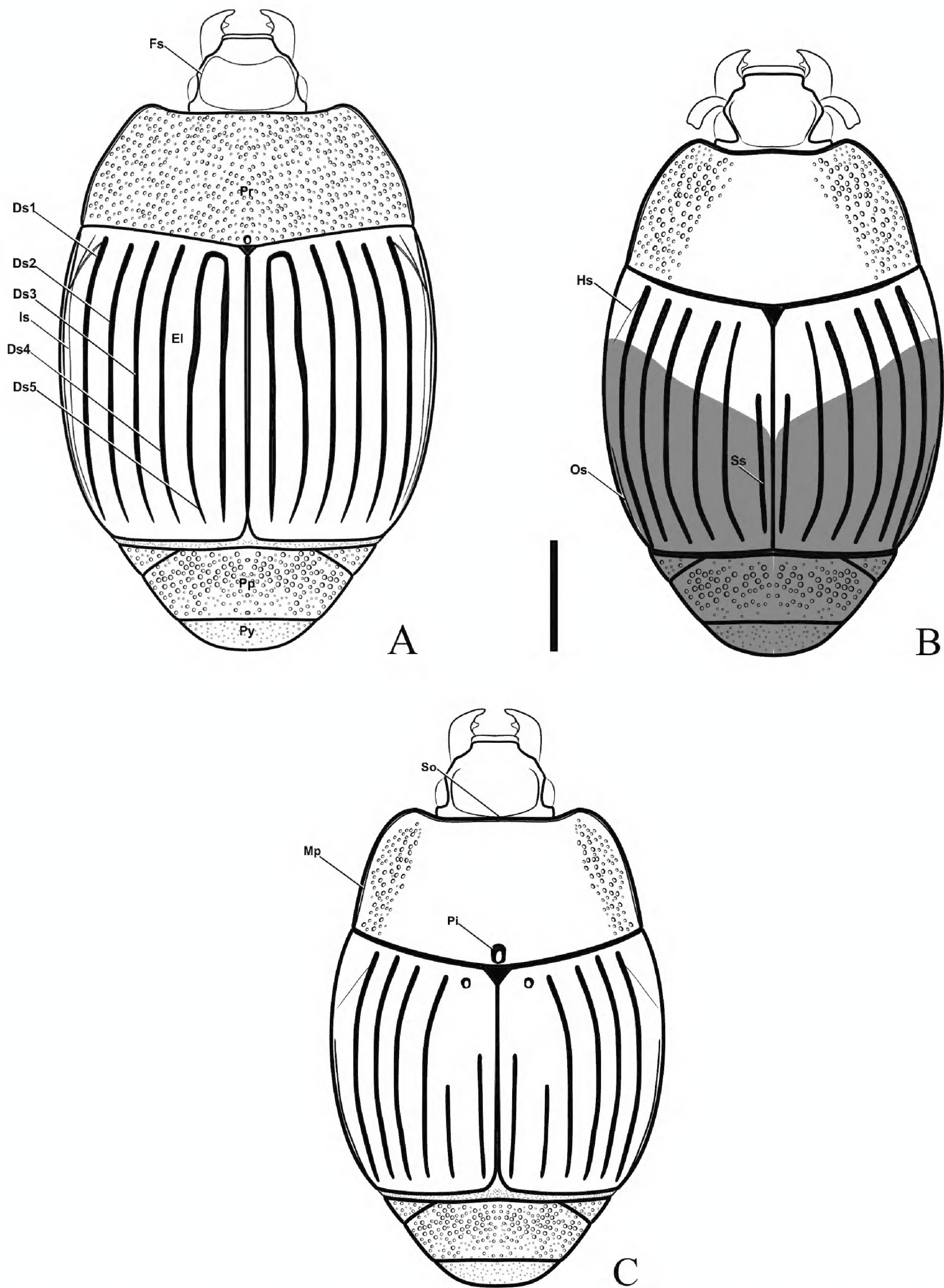


Figure 1. Habitus in dorsal view of *Phelister* species from Cuba. **A.** *P. completus*. **B.** *P. haemorrhous*. **C.** *P. panamensis*. Head (He): Fs = Frontal stria; So = Supraorbital stria. Pronotum (Pr): Mp = Marginal pronotal stria; Pi = Prescutellar impression. Elytron (El): Ds1...5 = Dorsal stria I–V; Hs = humeral stria; Is = Inner subhumeral stria; Os = Outer subhumeral striae; Ss = Sutural stria. Propygidium (Pp). Pygidium (Py). Scale bar = 0.5 mm.

leg.; CUB_YL_2010_02; CZCTR; found in pig. • 2 specimens; Santiago de Cuba Province, Carretera de El Cobre, km 10; 20.064°, –075.837°; 57 m a.s.l.; 25 Feb. 2017; Y. Lamoth leg.; CUB_YL_2010_04; ZSM; found in human. • 6 specimens; Santiago de Cuba Province, San Juan; 20.017° –075.792°; 215 m a.s.l.; 9 Jun 2020; Y. S.

Megna leg.; CUB_ YSM_2020_01; CZCTR; found in cow and horse.

Identification. TL = 1.6–1.9 mm; MW = 1.6–1.8 mm; body distinctly bicolored, elytra, pygidia and venter of apical abdominal segments with reddish markings; frontal stria broadly interrupted; supraorbital stria complete,

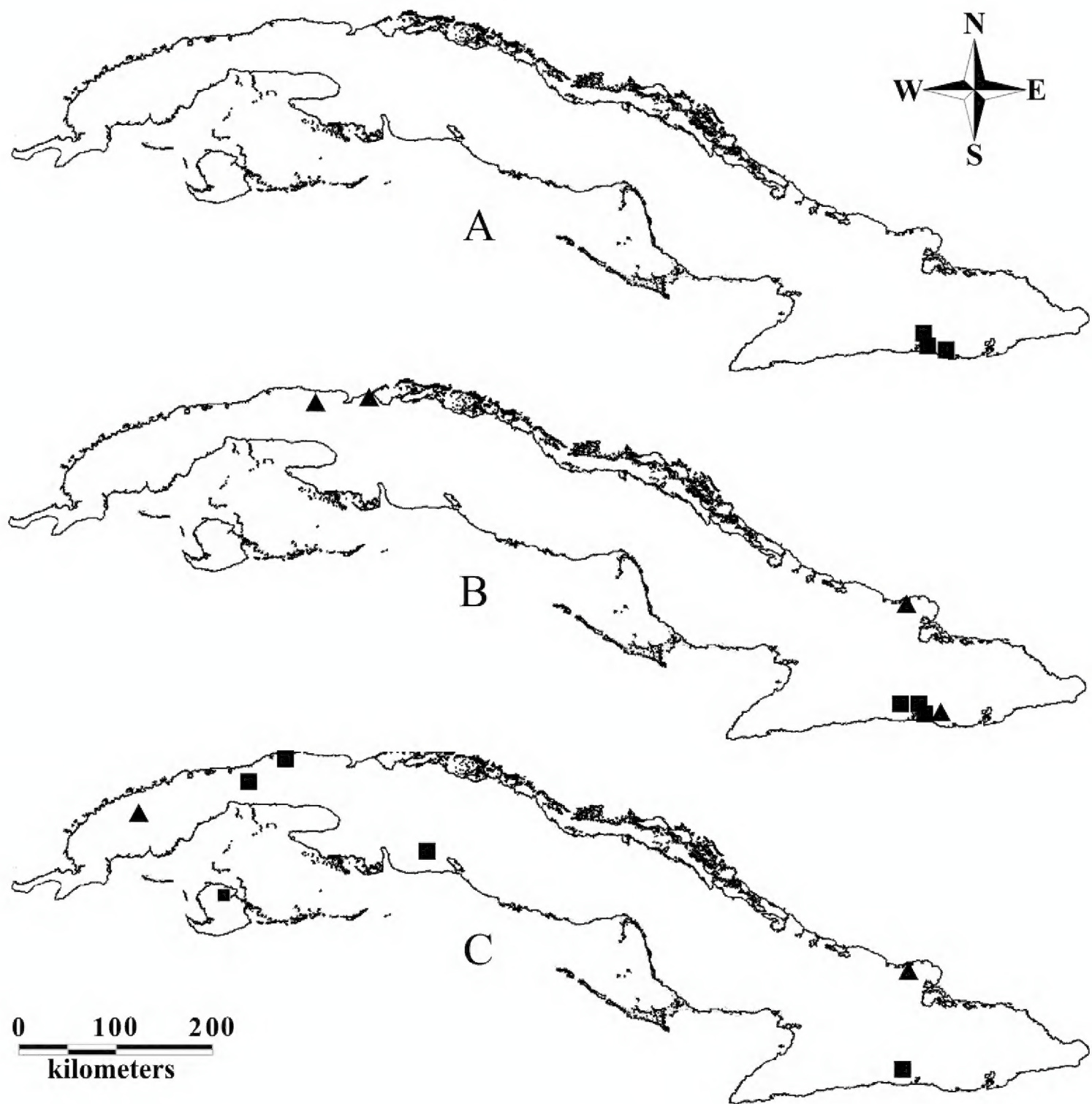


Figure 2. Known distribution of *Phelister* species in Cuba. **A.** *P. completus*. **B.** *P. haemorrhous*. **C.** *P. panamensis*. Triangles = records reported in literature, squares = material examined.

Table 1. Decomposition stages and substrate of collection for the species of *Phelister* in Cuba.

Species	Stages of decomposition					Collection substrate
	Fresh	Bloated	Decay	Post-decay	Skeletal	
<i>P. completus</i>				x		Pig
<i>P. haemorrhous</i>				x		Pig, human, cow, horse
<i>P. panamensis</i>			x	x	x	Pig

connected with frontal stria; pronotum without pre-scutellar impression; elytron with single, complete epipleural stria, outer subhumeral stria present in apical third, inner subhumeral stria absent, dorsal elytral striae I–IV complete; stria V complete or abbreviated basally; sutural elytral stria extending to approximately mid-length of elytra (Fig. 1b); propygidium shorter than pygidium, transverse; prosternal keel with carinal striae complete from base to presternal suture; protrochanter with a single seta; protibia with six evenly spaced marginal spines; protibia with one longitudinal stria on ventral surface.

Distribution. *Phelister haemorrhous* has a broad distribution ranging from USA, Mexico, Central and South America to the West Indies (Sokolov 2005; Caterino and

Tishechkin 2019). The species was recorded from both western and eastern parts in Cuba (Fig. 2b).

***Phelister panamensis* LeConte, 1859**
(Figs. 1c, 2c, Table 1)

Phelister panamensis LeConte 1859: 311—Summerlin et al. 1991a: 312, 1991b: 192; Mazur 1972: 189, 2011: 28.
Phelister panamae Marseul 1863: 707.
Phelister omissus Schmidt 1893: 85—Sokolov 2005: 85.
Phelister atrolucens Casey 1916: 231.
Phelister assimilis Wenzel and Dybas 1941: 467.

New records. CUBA • 2 specimens; Artemisa Province, Sierra de Anafe; 23 Nov. 1934; IZAC. • 11 specimens; Habana Province, Cojimar; 16 Feb. 1922; A. Bierig leg.; FMNH • 1 specimen; Isle of Pines, 1 Sep. 1950–19 Jan. 1951; L. Ross leg.; FMNH • 1 specimen; Cienfuegos Province, Soledad, 8 Jun. 1920; FMNH • 1 specimen; Cienfuegos Province, Soledad; 17 Oct. 1926; P. Darlington leg.; FMNH • 2 specimens; Habana Province, Jamaica; A. Bierig leg.; FMNH • 7 specimens; Santiago de Cuba Province, Carretera de El Cobre, km 10; 20.064°, –075.837°; 57 m a.s.l.; 24–26 Feb. 2017; Y. Lamothe leg.; CUB_YL_2010_04; CZCTR; IZAC; found in pig.

Identification. TL = 1.6–1.8 mm; MW = 1.8–2.0 mm;

body color piceous; frontal stria broadly interrupted medially; supraorbital stria continuous with frontal stria; pronotum with pre-scutellar impression, small, ovoid; elytron with one complete epipleural stria, outer subhumeral stria present in just over apical half, inner subhumeral stria absent, dorsal elytral striae I–IV complete, stria V and sutural elytral one extending to approximately elytral mid-length (Fig. 1c); propygidium relatively long, subequal to or greater in midline length than pygidium; prosternal keel with carinal striae complete from base to presternal suture; protrochanter lacking setae; protibia with six evenly spaced marginal spines and with two longitudinal striae on ventral surface.

Distribution. Prior to this study, *P. panamensis* had been recorded from the USA, Mexico, Guatemala, Nicaragua, Panama, and the “Neotropical Region” (Blackwelder 1944; Mazur 2011). It is widely distributed in Cuba (Fig. 2c).

Key to *Phelister* of Cuba

1. Elytron with fifth dorsal elytral stria united under a rather narrow arch with the sutural elytral stria (Fig. 1a, Ds5); pronotum without anterior portion of marginal stria; elytral epipleura bistrate, with marginal epipleural and both outer and inner subhumeral striae complete (Fig. 1a) ***P. completus* Schmidt, 1893**
- Elytron with fifth dorsal elytral stria not arched to the sutural stria (Fig. 1b); pronotum with anterior portion of marginal stria (Fig. 1c, Mp); subhumeral striae incomplete or absent **2**
2. Pronotum without pre-scutellar impression; elytra with reddish markings extending onto propygidium, pygidium, and venter of apical abdominal segments (Fig. 1b) ... ***P. haemorrhous* Marseul, 1853**
- Pronotum with pre-scutellar impression (Fig. 1c, Pi); elytra, propygidium, pygidium and venter of apical abdominal segments piceous (Fig. 1c) ***P. panamensis* LeConte, 1860**

Discussion

This study increases the number of *Phelister* species of Cuba to three. One of these species (*P. completus*) is a new record to the West Indies. The closest previous records for this species according to Mazur (2011) were from Mexico and Costa Rica. The remaining species, *P. haemorrhous* and *P. panamensis*, are common and widespread in the country (Fig. 2b, c). However, more collecting efforts would be required to better clarify the distribution of species of the genus. For this study, only a total of 14 specimens of *Phelister* were collected (in addition to other unpublished records reported herein).

We collected all the herein presented species on cadavers of pig, human, cow, and horse. The prevalence of all *Phelister* species associated with carcasses suggests that these species may have forensic importance (Table 1). In general, other Histeridae have been proven

valuable in forensic investigations, their occurrence helping in the estimation of time since death (Aballay et al. 2013; Zanetti et al. 2015; Sawaby et al. 2016; Correa et al. 2020).

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Authors' Contributions

YSM wrote the manuscript. YLM, MSC and YSM identified the species. YLM organized fieldwork and collected several specimens. MSC studied the historical specimens in the CMNC and FMNH collections. YSM, YLM, MSC, and TL coordinated the research and revised the manuscript. All authors corrected, revised, and discussed the data.

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